

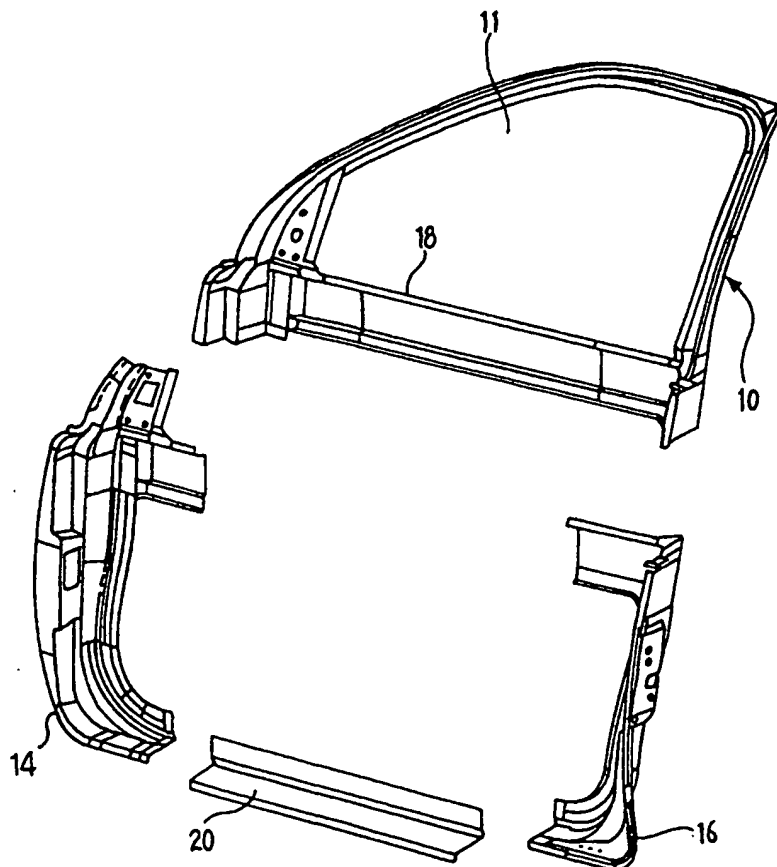
## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(21) International Application Number: <b>PCT/EP00/00381</b></p> <p>(22) International Filing Date: <b>19 January 2000 (19.01.00)</b></p> <p>(30) Priority Data: <b>TO99A000044</b>      <b>22 January 1999 (22.01.99)</b>      <b>IT</b></p> <p>(71) Applicant (for all designated States except US): <b>E.M.A.R.C. S.P.A. [IT/IT]; Viale Piemonte, 0/9, I-10048 Vinovo (IT).</b></p> <p>(72) Inventor; and (75) Inventor/Applicant (for US only): <b>PASSONE, Pietro [IT/IT]; Viale Buoizzi, 7, I-10048 Vinovo (IT).</b></p> <p>(74) Agents: <b>GERBINO, Angelo et al.; Jacobacci &amp; Perani S.p.A., Corso Regio Parco, 27, I-10152 Torino (IT).</b></p>	<p>(81) Designated States: <b>AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</b></p> <p><b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i></p>	

(54) Title: A FRAME FOR A MOTOR VEHICLE DOOR AND A DOOR INCLUDING IT

## (57) Abstract

A frame for a motor vehicle door which includes an upper portion (10) surrounding the window opening (11) and a lower portion (12) fixed to the said upper portion (10). The lower portion (12) is made up of at least two separate, shaped elements fitted together. The lower portion (12) is preferably formed by substantially vertical first and second elements (14, 16), the upper ends of which are fitted to the front and rear ends of a lower strut (18) of the upper portion (10), the lower ends of the first and second elements (14, 16) being connected by a substantially horizontal third element (20).



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A frame for a motor vehicle door and a door including it

The present invention relates to a frame for a motor vehicle door.

More specifically, this frame comprises an upper portion surrounding the window opening and a lower portion fixed thereto.

In a first arrangement known in the art, the lower portion is pressed in one piece from sheet metal and subsequently fixed to the upper portion.

The various parts of the lower portion are subjected to different mechanical stresses, making it necessary to form them from metal of different thicknesses, thereby increasing production costs.

This method has the added disadvantage of requiring complicated and thus expensive equipment in order to press an item of such large dimensions as the lower portion of the frame of a motor vehicle door.

Furthermore, this method produces a significant quantity of waste metal, thereby further increasing production costs.

In another method used in the prior art, the entire frame, comprising the upper and lower portions, is pressed in one piece from sheet metal.

This method suffers from the same disadvantages as the first, made worse by the fact that the piece to be pressed is even larger.

For the purpose of obviating these disadvantages, the object of the present invention is to provide a frame of the type previously mentioned, characterised in that the lower portion is made up of at least two separate shaped elements fixed together.

Preferably, the aforesaid lower portion is formed by substantially vertical first and second elements, the upper ends thereof being fixed to the front and rear ends of a lower strut of the upper portion, the lower ends of the said first and second vertical elements being connected by a third, substantially horizontal element.

The equipment required to produce the individual elements of the frame of the invention is far simpler, since the parts are far less complex to form.

The invention makes it possible to reduce fixed production costs dramatically and operating costs as well, as a result of a noticeable reduction in the amount of waste metal produced.

A further advantage provided by the invention lies in the fact that it is possible to produce different frames for different models of motor vehicle by changing only one, or in any event only part of, the constituent elements, maintaining the others unaltered and thereby achieving evident savings.

The choice of material constituting the individual elements of the frame is substantially immaterial for the purposes of the invention. In each case, the most suitable material can be selected in order to achieve the required performance; for example aluminium, steel or other metal alloys.

In the same way, there are no particular limitations on the methods used to manufacture the individual pieces or to assemble them. The most suitable method can thus be used to manufacture each element, or pair of elements to be assembled.

A motor vehicle door including a frame of the type described above also constitutes a subject of the present invention.

Further advantages and characteristics of the present invention will become clear from the detailed description which follows, and which refers to the appended drawings, provided purely by way of non-limitative example, in which:

Figure 1 is a perspective view of a door frame for a motor vehicle made in accordance with the invention, and

Figure 2 is an exploded view of the frame of Figure 1.

A frame for a motor vehicle door includes (see Figure 1) an upper portion 10 which surrounds the window opening 11 and a lower portion 12 fixed to the upper portion 10.

The lower portion 12 is formed (see Figure 2) by first and second substantially vertical shaped elements 14, 16, the upper ends of which are fixed to the front and rear ends respectively of a lower strut 18 of the upper portion 10. The

lower ends of the first and second vertical elements 14, 16 are connected by a third, substantially horizontal element 20. Any suitable method known in the art can be used to form these connections, such as welding, for example.

The upper portion 10 and the elements 14, 16 of the lower portion 12 are preferably obtained by pressing, the advantage of this being that sheet metal of a constant thickness can be used, as raw material, to press each of them.

The third element 20 is preferably obtained by forming, with an appropriate length being cut from an extruded section. By cutting elements of different lengths from the same extruded section, it is possible to form elements to produce frames for the doors of different models of a motor vehicle, still using one or more of the other elements 10, 14 and 16 constituting the frame described above.

This frame can then be fitted together with the other components of a motor vehicle door - such as a window-frame, a side impact protection bar, an outer panel for covering the lower portion, a window pane and its associated movement devices - in the same way as for a conventional door frame, without any need to adapt conventional assembly methods.

Naturally, the principle of the invention remaining the same, manufacturing details and embodiments may vary widely from those described here purely by way of non-limitative example, without departing thereby from the scope of the invention.

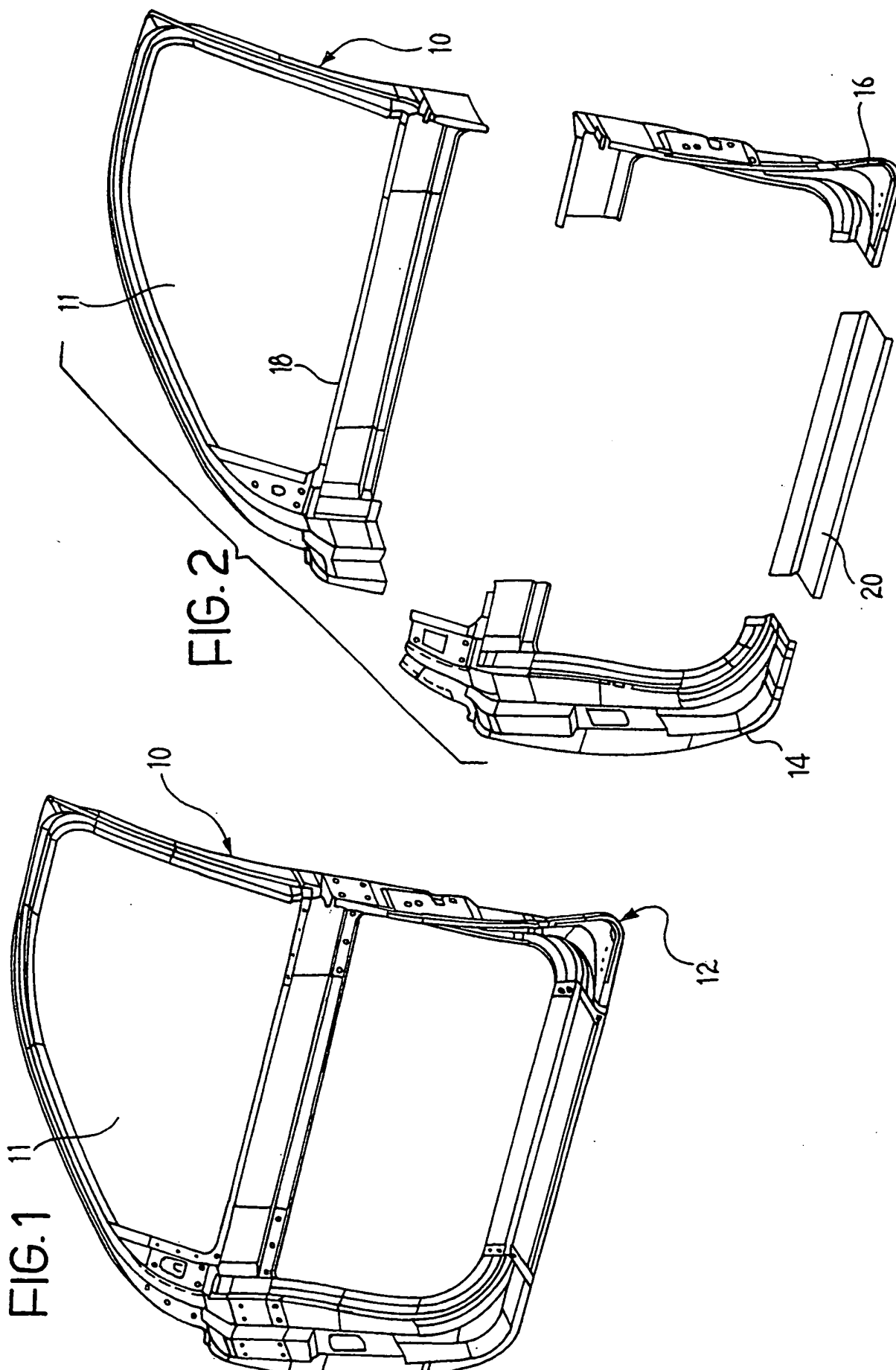
The lower portion of the frame of the invention could, for example, be constituted in principle by any number of elements equal to or greater than two, while their shape may be chosen substantially freely.

CLAIMS

1. A frame for a motor vehicle door, including an upper portion (10) for surrounding the window opening (11) and a lower portion (12) fixed to the upper portion (10), the said frame being characterised in that the lower portion (12) is formed by at least two separate shaped elements fixed together.
2. A frame for a motor vehicle door, according to Claim 1, characterised in that the said lower portion (12) is formed by substantially vertical first and second elements (14, 16), the upper ends of which are fixed to the front and rear ends respectively of a lower strut (18) of the upper portion (10), the lower ends of the said first and second vertical elements (14, 16) being connected by a third, substantially horizontal element (20).
3. A frame for a motor vehicle door according to Claim 2, characterised in that the said upper portion (10) and/or the said first element (14) and/or second element (16) of the lower portion (12) are manufactured by pressing.
4. A frame for a motor vehicle door according to either of Claims 2 or 3, characterised in that the said third element (20) is manufactured by forming.
5. A door for a motor vehicle which includes a frame according to any preceding Claim.



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# INTERNATIONAL SEARCH REPORT

national Application No

PCT/EP 00/00381

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 B60J5/04

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 B60J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 776 778 A (RENAULT) 4 June 1997 (1997-06-04) column 2, line 52 -column 4, line 31; figures	1,2,5
X	GB 2 316 431 A (ROVER GROUP) 25 February 1998 (1998-02-25) page 2, line 17 -page 3, line 14; figures	1,2,5
X,P	EP 0 916 534 A (SCHADE) 19 May 1999 (1999-05-19) page 4, column 5, line 42 - line 54; figure 10	1,2,5
A	EP 0 803 389 A (YMOS) 29 October 1997 (1997-10-29) abstract; figures	1
	-/-	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 40 08 111 A (AUDI) 19 September 1991 (1991-09-19) abstract; figures	1
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national Application No

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